

The Point/Downtown Drainage Projects Frequently Asked Questions

This document is a compilation of various questions posed by residents within the Point/Downtown Drainage Study area. This document will continue to be updated throughout the planning and construction process.

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GENERAL FAQ

1. Where can additional information be found regarding these projects?

- a. The City maintains a Point/Downtown Drainage Projects page on our website that we will update to share project information. We are also in the process of developing a public portal for all our capital projects that will be available sometime this spring.

<https://www.cityofbeaufort.org/682/DowntownThe-Point-Drainage-Project>

2. Every project proposed other than the King Street Project involves merely rerouting and expanding drainage. Why is the King Street Project the only area you deem necessary to add a pump?

- a. A significant area (over 40 acres) drains to the pond at Knott Park. King Street, adjacent to the existing pond, has an elevation lower than many high tides. Without the use of a pumping system, the capacity of the existing outfall decreases as the level of the tide increases, resulting in limited to no discharge capacity depending upon the elevation of the tide. High tide elevations coinciding with rainfall may result in flooding, as the existing outfall would be unable to discharge. The proposed pump station allows discharge from the pond to occur for all but the extreme tidal condition where Federal Street overtopping occurs.

3. Why isn't increased drainage capacity sufficient here? Could that capacity be enhanced without requiring a pump? (more on this below)

- a. The elevation of lower portions of King Street average approximately 4.50 feet NAVD-88 and the tidal pond has limited storage (NAVD = North American Vertical Datum, which is the standard used in vertical surveying). The peak daily observed tide over 442 days in 2022 and 2023 exceeded this elevation on 93 occasions. Pumping is the only method that can reduce in-street flooding when rain and higher tide events coincide.

4. How loud will the King Street generator be?

- a. According to manufacturer data, the selected generator set is expected to produce a sound pressure level of approximately 77.4 dB(A) in close proximity to the equipment. This equipment is being specified with a critical grade silencer and corresponding enclosure (best standard equipment available on market). According to the data at the following link ([Levels of Noise](#)), the American Academy of Audiology groups the manufacturer reported noise level with “traffic, vacuums, and alarm clocks.”

5. When is the anticipated day and time of exercising the generator?

- a. The emergency backup generator will be automatically exercised on a programmed schedule by the pump station control system. In general, exercise of equipment would likely occur weekly, on a weekday, and around midday.

6. Have the neighbors been consulted about the day and time the generator will be exercised?

- a. It is recommended that the owner exercise the emergency backup generator, and any other supporting equipment (e.g., pumps, valves, etc.), according to manufacturer recommendations. Every effort will be taken to minimize the effect of the generator use including communication and feedback collection from neighbors.

7. What is the capacity of the drainage system? Pond volume (with and without system), outflow pump flow rate, etc.

- a. The current discharge capacity is approximately 50 cubic feet per second (CFS) at low tide (elevation below the outfall) reducing to zero as the elevation of the tide approaches the water surface elevation of the pond. No discharge occurs when the elevation of the tide exceeds the pond elevation. The available storage volume in the pond is insignificant when compared to the volume of runoff volume generated by the watershed draining to it, hence the frequent flooding of King Street and surrounding properties of comparable elevation.

8. What impact on the capacity of the pond will the system have? According to [“The Point and Downtown Drainage Study”](#) for City of Beaufort Final Report – August 2022, the pond’s capacity is currently 1,700 cubic yards. Given a surface area of about 2,340 square yards (estimated by a satellite image), this implies an effective depth of just over 2 feet! Couldn’t dredging improve this capacity considerably? While the bottom of the pond would be disturbed by dredging, it will also be disturbed by constructing the wet well, so why not improve the performance of the entire pond?

- a. Dredging or removing material from the bottom of the pond and below the normal pool would provide no increase in the available (flood) storage volume of the pond. Expanding the surface area pond to increase available storage is also not practical due to property constraints, as the additional required surface area needed to offset installation of the pump station would be significant (multiple properties including roads and houses).

9. What is the velocity of the pump and resulting outfall?

- a. The critical case for velocity occurs at low tide and one pump running. The velocity at the existing outfall (4-foot by 4-foot box culvert) is approximately 4 feet per second, while the modeled velocity for the proposed structure is approximately 3 feet per second. This reduction in velocity occurs because of the energy dissipation feature and reduced volume of flow per unit width.

10. During an event when the pond intake is blocked to incoming water and the pump turned on, how will this not increase water levels in the tidal creek and marsh, especially directly adjacent to the outfall?

- a. The current pond outfall is equipped with a tide-regulating flap gate which limits the amount of water allowed to flow into, and therefore the elevation of the pond. This limited tidal exchange will be maintained as a part of the proposed design. The volume of water exchanged into and out of the pond as a part of the tidal cycle is infinitely small compared to the volume of water in the Beaufort River. Therefore, the existing and proposed continuation of controlling inflow does not change the level of the tide experienced downstream of Federal Street. In this same instance, should the proposed pump(s) be energized, the expected maximum increase in water surface elevation in the creek and the marsh downstream of Federal Street is on the order of one inch immediately downstream of the structure, and quickly diminishes to the point where there is no measurable (as modeled in detail) increase before the tidal creek joins the Beaufort River. This is due to the large storage volume available in the Beaufort River, and the substantial conveyance capacity (ability to carry or move flow) of the creek immediately downstream of Federal Street.

11. The proposal (which may not be part of the current engineered plan) for a deck over the pump station raises many issues – i.e., the privacy of neighbors, policing, litter, etc.?

- a. The elevation of the deck of the pump station is expected to be set at 10.75 feet NAVD88 and is below the City's minimum finished floor elevation (FFE) requirement of 13 feet NAVD88 for surrounding buildings. Further, and to the extent practical, existing vegetation and trees will be maintained to the maximum extent to reduce increases in the visibility of existing structures, as viewed from the proposed pump station.

12. Where exactly is the outfall being placed? What direction is the outfall being focused? How loud will the outfall be?

- a. The proposed outfall will be located in substantially the same place as that of the existing outfall, and the discharge will be directed downstream and approximately parallel to the centerline of the existing tidal creek. In addition to the pumped outfall, a new gravity-based outfall will also be constructed to maintain the capacity of the existing outfall should either the control system fail or both utility and backup power supplies fail simultaneously.

13. It would be helpful to have some idea of the control state table that will be utilized with this system. For example, and just hypothetically, would the below be correct?

	High Tide King Tide Storm Surge	High Tide King Tide Storm Surge	Low Tide	Mean Tide	Rain Events
Pump On	No	yes	Yes	Yes	Depends on condition
Change in pond surface height vs current	None	Higher	None	Lower	Higher
Change in marsh creek surface height vs current	None	Higher	Higher	Higher	Higer

- a. The pump can be expected to run anytime a significant inflow to or stage within the pond is predicted or observed, provided that the tide is at an elevation lower than Federal Street.

14. It would also be helpful to understand how the proposed improvements will change the dynamics of the water level in the pond and creek. Figure 20 of the Final Report shows a tide hydrograph in which the impact of the tide, rainfall, and existing weir (low dam) can be seen on the pond water level. Could data from this example and other extreme conditions be used in your model to see how the pond and creek levels change due to the proposed system?

- a. Observed data collection between 2022 and 2023 shows that King Street has flooded at least three times adjacent to the pond. The inflow volume will not change as the same area will drain to the pond after installation of the pump station. The increased pond discharge capacity means upstream drainage conditions will improve. The pumps will not run frequently and there is no increase in runoff volume as a result of the project, so long-term changes in section or elevations within the pond or tidal creek are not expected. Further surveying has been conducted along the outfall area and the pumps will cause no discernible water level impact to these areas.

15. How will the outfall operate during normal tides? Will the proposed gravity outfall pipe have a higher flow rate than the current weir?

- a. The controls have not yet been designed. The proposed gravity outfall (weir and pipeline) will be sized to be of the same capacity as that of the existing outfall. Gravity discharge of runoff is the preferred option for releasing runoff and is possible if inflows are less than the pipe capacity and tidal conditions allow. For low tides, a combination gravity flow and one pump running may be possible. For intermediate and high tides, the entire capacity will be provided by pumping.

16. The Final Report mentions use of a ‘real-time controllable weir’ to improve pond drainage before pumps require activation. Is this device still in the preferred design? How much of the needed drainage could be achieved by 1) controllable weir, 2) improved drainage, 3) pond dredging? (i.e., could the pump be eliminated?)

- a. The 'real-time controllable weir' referenced in the report is intended to be a means to control the tidal inflow to the pond and/or lower the water surface elevation of the pond pre-emptively to provide additional storage volume prior to the arrival of a rainfall event, and therefore decrease (to the extent practical) the number of pump starts necessary to convey the runoff generated by the contributing watershed. This is a way to control the pond level in real time. The proposed design will utilize an actuator-controlled valve on a pipeline between the wet-well and outfall to maintain the existing tidal exchange within the pond and, if beneficial, limit such exchanges prior to the arrival of the rainfall event. The proposed pumps would then be used to lower the water surface elevation of the pond providing additional storage and conveyance capacity within the collection and conveyance system. Neither of the two solutions mentioned (real time controllable weir or an actuator-controlled valve) are a means by which to eliminate the need for the proposed pump station.

17. Is the real-time controllable weir being operated based on actual existing conditions or predicted conditions?

- a. This feature is conceptualized to work with forecasted data to allow for dynamic control of the water surface elevation in the pond to maximize storage volume available and to minimize (to the extent practical) the number of pump starts required. Control schemes are still being considered in the design where beneficial to the project performance.

18. Has this type of system been in place and used elsewhere? Are the conditions similar to a pond which is draining into an active tidal creek/marsh? If so, what were the impacts?

- a. Stormwater pump stations of this size and scope have been implemented successfully by the Town of Mount Pleasant, S.C., in the James B. Edwards Park on the corner of Pitt Street and Ferry Street in Olde Mount Pleasant; and at Hilton Head Island, including the Jarvis Creek and Lawton Canal pump stations; and others of comparable or larger sizes in Charleston, Georgetown, and Savannah. The implementation of these pump stations resulted in substantial improvements to drainage performance and the reduction of flooding experienced by the properties and public rights-of-way served.